

WHAT IS CLAIMED IS:

1. An aqueous dispersion comprising fumed alumina particles, at least one zirconium compound, and water.
2. The aqueous dispersion of claim 1, wherein the fumed alumina particles have an average aggregate particle size (by number) of about 400 nm or less.
3. The aqueous dispersion of claim 2, wherein the fumed alumina particles have an average aggregate particle size (by number) of about 100-200 nm.
4. The aqueous dispersion of claim 1, wherein the fumed alumina particles have a BET surface area of about 30-200 m<sup>2</sup>/g.
5. The aqueous dispersion of claim 4, wherein the fumed alumina particles have a BET surface area of about 40-100 m<sup>2</sup>/g.
6. The aqueous dispersion of claim 1, wherein the zirconium compound is a water-soluble zirconium compound selected from the group consisting of acetylacetone zirconium complexes, zirconium carbonate, zirconium sulfate, zirconium oxychloride, zirconium acetate, zirconium nitrate, zirconium hydroxide, ammonium zirconium carbonate, potassium zirconium carbonate, zirconium hydroxychloride, zirconium propionate, zirconium sulfate, zirconium phosphate, zirconium sodium phosphate, zirconium hexafluoride, and a mixtures thereof.
7. The aqueous dispersion of claim 6, wherein the water-soluble zirconium compound is zirconium hydroxychloride.
8. The aqueous dispersion of claim 6, wherein the total amount of the zirconium compound in the dispersion is sufficient to provide an equivalent weight ratio of zirconium oxide to fumed alumina of at least about 0.05.
9. The aqueous dispersion of claim 8, wherein the total amount of the zirconium compound in the dispersion is sufficient to provide an equivalent weight ratio of zirconium oxide to fumed alumina of about 0.05-0.6.

10. The aqueous dispersion of claim 8, wherein the total amount of the zirconium compound in the dispersion is sufficient to provide an equivalent weight ratio of zirconium oxide to alumina of about 0.1-0.3.

11. The aqueous dispersion of claim 1, wherein the pH of the dispersion is about 1-7.

12. The aqueous dispersion of claim 11, wherein the pH of the dispersion is about 2-6.

13. The aqueous dispersion of claim 12, wherein the pH of the dispersion is about 2-5.

14. The aqueous dispersion of claim 1, wherein

- (a) the fumed alumina particles have an average aggregate particle size (by number) of about 400 nm or less,
- (b) the fumed alumina particles have a BET surface area of about 30-200 m<sup>2</sup>/g,
- (c) the zirconium compound is a water-soluble zirconium compound selected from the group consisting of acetylacetone zirconium complexes, zirconium carbonate, zirconium sulfate, zirconium oxychloride, zirconium acetate, zirconium nitrate, zirconium hydroxide, ammonium zirconium carbonate, potassium zirconium carbonate, zirconium hydroxychloride, zirconium propionate, zirconium sulfate, zirconium phosphate, zirconium sodium phosphate, zirconium hexafluoride, and a mixtures thereof,
- (d) the total amount of the zirconium compound in the dispersion is sufficient to provide an equivalent weight ratio of zirconium oxide to fumed alumina of at least about 0.05, and
- (e) the pH of the dispersion is about 1-7.

15. The aqueous dispersion of claim 14, wherein the water-soluble zirconium compound is zirconium hydroxychloride.

16. The aqueous dispersion of claim 15, wherein the total amount of the zirconium compound in the dispersion is sufficient to provide an equivalent weight ratio of zirconium oxide to fumed alumina of about 0.05-0.6.

17. The aqueous dispersion of claim 16, wherein the fumed alumina particles have an average aggregate particle size (by number) of about 100-200 nm, the fumed

alumina particles have a BET surface area of about 40-100 m<sup>2</sup>/g, the total amount of the zirconium compound in the dispersion is sufficient to provide an equivalent weight ratio of zirconium oxide to alumina of about 0.1-0.3, and the pH of the dispersion is about 2-5.

18. A coating composition comprising the dispersion of claim 1 and at least one binder.

19. The coating composition of claim 18, wherein the binder is selected from the group consisting of cellulose esters, cellulose ethers, vinyl polymers, acrylic polymers, polyesters, polycarbonate polymers, polyamides, polyimides, epoxy polymers, phenolic polymers, polyolefins, copolymers thereof, and a mixture thereof.

20. The coating composition of claim 18, wherein the binder is a polyvinyl alcohol.

21. The coating composition of claim 18, wherein the total amount of binder in the coating composition is about 0.5-15% by weight.

22. The coating composition of claim 21, wherein the total amount of binder in the coating composition is about 1-10% by weight.

23. A recording medium comprising a substrate and the coating composition of claim 1 applied to at least a portion of the substrate.

24. The recording medium of claim 23, wherein the substrate is paper.

25. The recording medium of claim 24, wherein the recording medium exhibits enhanced resistance to ozone-mediated degradation of a dye printed on the recording medium as compared to the same recording medium that does not comprise fumed alumina particles and at least one zirconium compound.

26. A method for preparing a recording medium comprising  
(a) providing a substrate,  
(b) providing a coating composition of claim 18,  
(c) coating at least a portion of the substrate with the coating composition to provide a coated substrate, and  
(d) drying the coated substrate to provide a recording medium.

27. The method of claim 26, wherein the substrate is paper.
28. The method of claim 27, wherein the recording medium exhibits enhanced resistance to ozone-mediated degradation of a dye printed on the recording medium as compared to the same recording medium that does not comprise fumed alumina particles and at least one zirconium compound.
29. A method for improving the resistance of a recording medium to ozone-mediated degradation comprising coating at least a portion of a substrate with the coating composition of claim 18.